802.11g Wireless LAN Cardbus Adapter

User Manual

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Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio technician for help.

FCC Caution

This equipment must be installed and operated in accordance with provided instructions and a minimum 5 cm spacing must be provided between computer mounted antenna and person's body (excluding extremities of hands, wrist and feet) during wireless modes of operation.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the authority to operate equipment.

Federal Communication Commission (FCC) Radiation Exposure Statement

This equipment complies with FCC radiation exposure set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.

R&TTE Compliance Statement

This equipment complies with all the requirements of DIRECTIVE 1999/5/CE OF THE EUROPEAN PARLIAMENT AND THE COUNCIL of March 9, 1999 on radio equipment and telecommunication terminal Equipment and the mutual recognition of their conformity (R&TTE)
The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) As of April 8, 2000.

Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the equipment.

EU Countries Intended for Use

The ETSI version of this device is intended for home and office use in Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.
The ETSI version of this device is also authorized for use in EFTA member states: Iceland, Liechtenstein, Norway, and Switzerland.

EU Countries Not intended for use

None.

CONTENTS

1 INTRODUCTION 1

1.1 FEATURES 1
1.2 SPECIFICATIONS 1
1.3 PACKAGE CONTENTS 2

2 INSTALLATION PROCEDURE 3

3 CONFIGURATION UTILITY 10

3.1 WIRELESS CONNECTION STATUS 10
3.2 PROFILE MANAGEMENT 11
3.3 DIAGNOSTICS 12
3.4 SECURITY 13

3.4.1 WPA Setting 15

3.4.2 Using WPA Passphrase Security 22

3.4.3 Pre-Shared Encryption Keys 23

OVERWRITING AN EXISTING STATIC WEP KEY 24
DISABLING STATIC WEP 24

4 TROUBLESHOOTING 25

1 Introduction

Thank you for purchasing the 802.11g Wireless LAN Carbus Adapter. This Adapter is designed to comply with IEEE 802.11g Wireless LAN standard and easy to carry with the Mini size. It is suitable for any Laptop or Desktop computers.

This adapter supports 64/128/152-bit WEP data encryption that protects your wireless network from eavesdropping. It also supports WPA (Wi-Fi Protected Access) feature that combines IEEE 802.1x and TKIP (Temporal Key Integrity Protocol) technologies. Client users are required to authorize before accessing to APs or AP Routers, and the data transmitted in the network is encrypted/decrypted by a dynamically changed secret key.

It supports the SuperG mode feature to enhance the data rate to reach to 108Mbps, it can enhance the data rate when it connect with Super G product.

This adapter is with the versatile features; it is the best solution for you to build your wireless network.

1.1 Features

- Complies with the IEEE 802.11b and IEEE 802.11g 2.4GHz standards.
- Up to 54Mbps high data transfer rate. (108M : Super G mode enabled)
- Support 64/128/152-bit WEP, WPA, IEEE 802.1x high level of security.
- Complies with IEEE 802.11d country roaming standard.
- Support the most popular operating system: Windows 98SE/Me/2000/XP.
- Supports Standard 32bit Cardbus interface.
- Portable and Compact-size design.
- Suitable for Any Notebook.

1.2 Specifications

- Standard: IEEE 802.11g/b
- Bus Type: 32-bit Cardbus
- Frequency Band: 2.4000~2.4835GHz (Industrial Scientific Medical Band)
- Modulation: OFDM with BPSK, QPSK, 16QAM, 64QAM (11g)

  BPSK, QPSK, CCK (11b)
- Data Rate: 54/48/36/24/18/12/11/9/6/5.5/2/1Mbps auto fallback (108Mbps: Super G enabled)
- Security: 64/128/152-bit WEP Data Encryption, WPA , IEEE 802.1x
- Antenna: Internal Antenna
- Drivers: Windows 98SE/Me/2000/XP/2003 Server
- LED: Link, Activity
- Transmit Power: 16 ~18 dBm (Typical)

- Dimension: 8(H) x 118(W) x 54(D) mm
- Temperature: 32~131°F (0 ~55°C)
- Humidity: 0-95% (NonCondensing)
- Certification: FCC, CE

1.3 Package Contents

Before you begin the installation, please check the items of your package. The package should include the following items:

- One PC Card
- One CD (Driver/Utility/User's Manual.)
- One Quick Guide

If any of the above items is missing, contact your supplier as soon as possible.

2 Installation Procedure

Before you proceed with the installation, please notice following descriptions.

Note1: The following installation was operated in Windows XP. (Procedures are similar for Windows 98SE/Me/2000)

Note2: If you have installed the Wireless PC Card driver & utility before, please uninstall the old version first.

Note3: For Windows 98SE please make sure your copy of windows is fully updated with the latest hotfixes by going to http://windowsupdate.microsoft.com

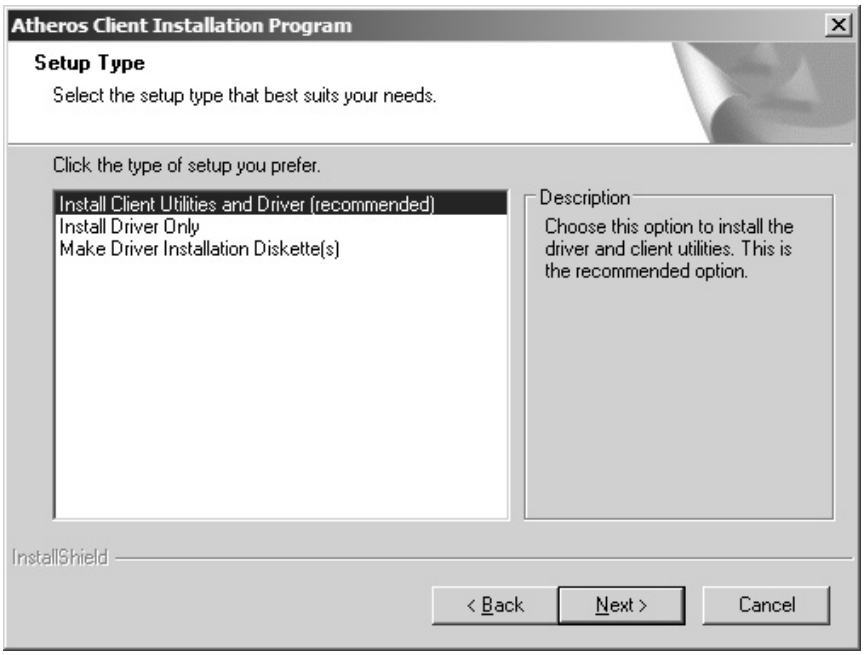
This chapter describes using the Atheros installer to install the Atheros wireless network adapter driver.

Installation

Note: Please ensure the Super-G cardbus adapter is firmly inserted to the cardbus slot before starting the setup program.

To install the ACU and device driver:

1. Insert the device into the computer, and insert the installation CD.
2. Open the InstallShield Wizard (**setup.exe**).
3. The Atheros Client Installation installer opens. Select the language you wish the installation program to proceed in. Click Next.
4. The Atheros license agreement window appears. Read and accept the agreement to continue. Click Next.
5. The Installation Program window appears with three setup options.

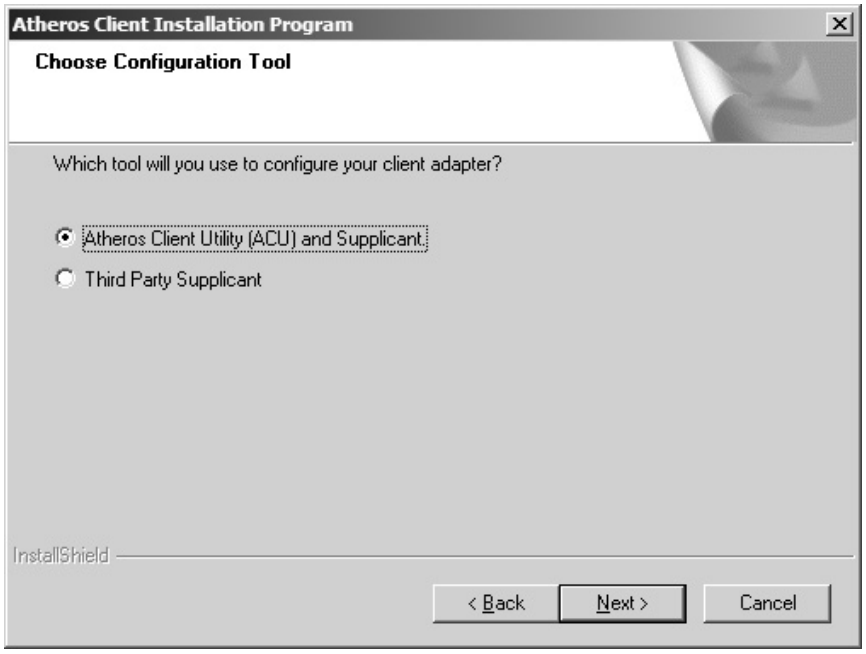

Atheros Client Installation Program
Setup Type
Select the setup type that best suits your needs.
Click the type of setup you prefer.
Install Client Utilities and Driver (recommended)
Install Driver Only
Make Driver Installation Diskette(s)
Description
Choose this option to install the driver and client utilities. This is the recommended option.
InstallShield
< Back
Next >
Cancel

To install the client utilities and driver, select the appropriate installation type (see Table (2-1) and click Next.

Table 2-1. **Installer Installation Selections**

Radio Button	Description
Install Client Utilities and Driver (recommended)	Installs the driver and client utilities. This is the recommends option.
Install Driver Only	Installs only the driver without installing the client utilities.
Make Driver Installation Diskette(s)	Creates driver installation diskettes.

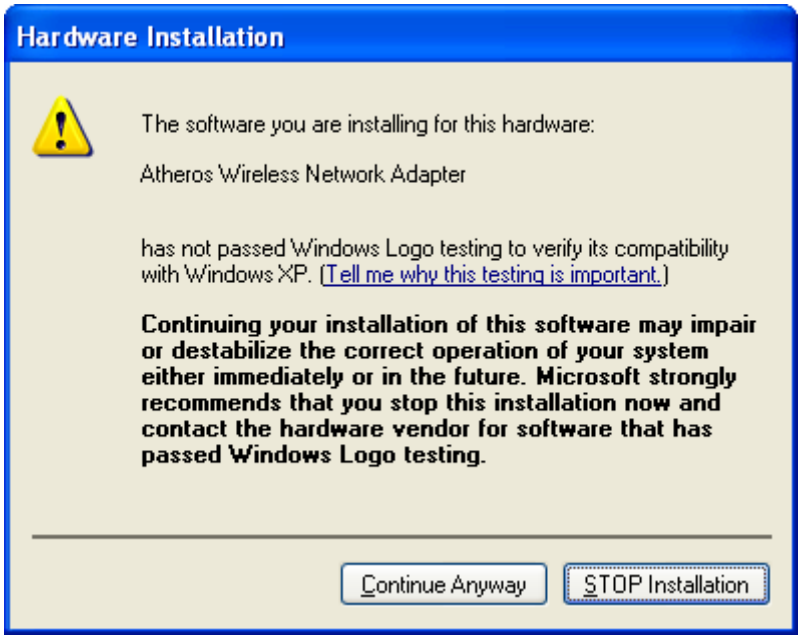
6. A prompt appears warning that the install requires the system to be rebooted at the end of the installation process. Click Yes to continue.
7. Choose the setup directory. The default is **C:\Program Files \ Atheros.** Click Next.
8. Choose the program folder for the start menu. The default is **Atheros.** Click Next.
9. For a windows XP installation, the next screen defines the Windows Zero Configuration. Windows XP Zero Configuration provides functionality to automatically try to connect the station to available wireless networks. For complete information on Windows Zero Configuration, see the Microsoft web site.
10. In this installation, select the Atheros Client Utility and Supplicant.


Atheros Client Installation Program
Choose Configuration Tool
Which tool will you use to configure your client adapter?
Atheros Client Utility (ACU) and Supplicant
Third Party Supplicant
InstallShield
< Back
Next >
Cancel

Click Next. The installer automatically installs the driver.

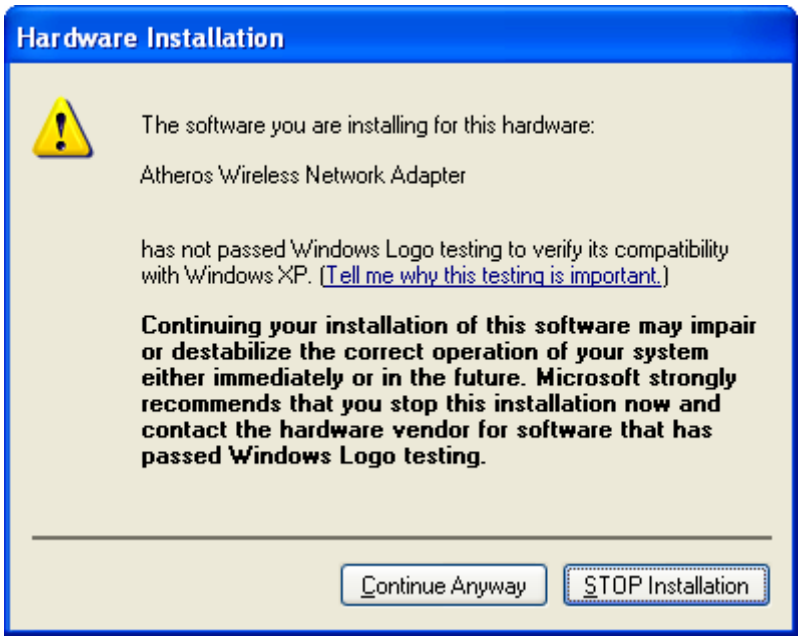
11. Make sure that the USB device is inserted. If it is not, insert it, then cancel the found New Hardware Wizard if it appears. Proceed with the installation. Click OK.

12. Windows may display a Windows Logo error for the USB bootloader. Click Continue Anyway.


Hardware Installation
The software you are installing for this hardware:
Atheros Wireless Network Adapter
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

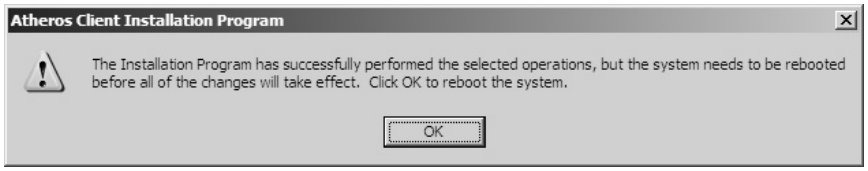
The installer continues installation.

13. Windows may display a Windows Logo error for the WLAN driver. Click Click Continue Anyway.


Hardware Installation
The software you are installing for this hardware:
Atheros Wireless Network Adapter
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

The installer continues installation.

14. Click OK at the prompt to reboot and complete the installation.


Atheros Client Installation Program
The Installation Program has successfully performed the selected operations, but the system needs to be rebooted before all of the changes will take effect. Click OK to reboot the system.
OK

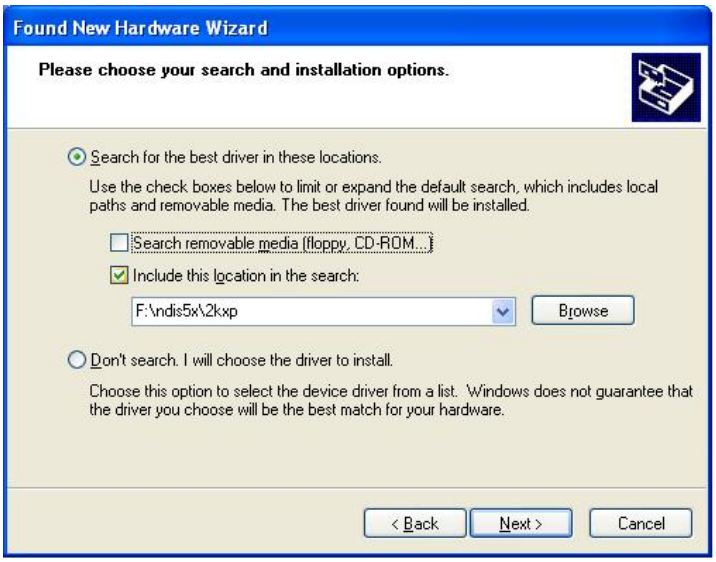
Installing the Atheros USB Wireless Network Adapter

To install the USB driver and the Atheros Client Utility, see “To install the ACU and USB device driver:” on page 2-1.

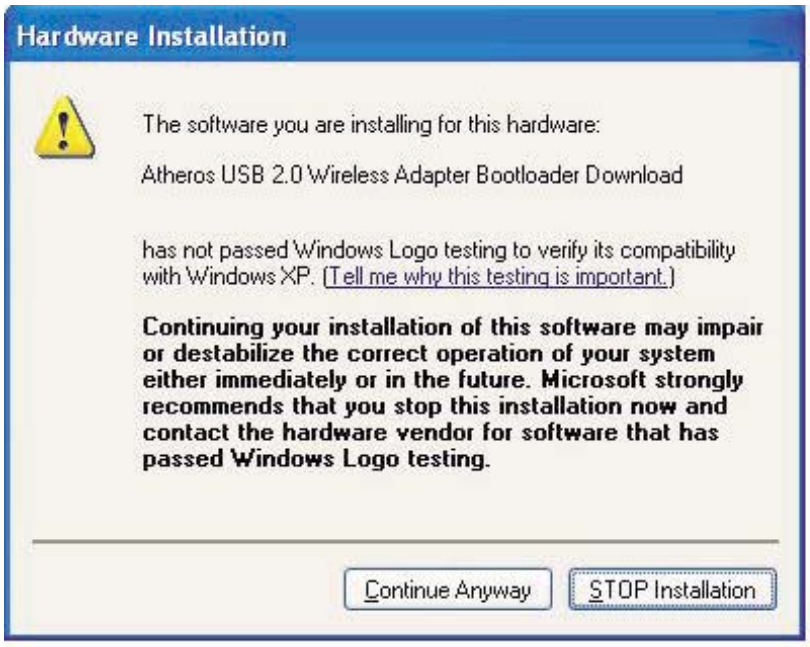
To install the USB Device Driver separately:

1. Insert the USB device into the computer: The Found New Hardware Wizard opens. Choose advanced installation and click Next.

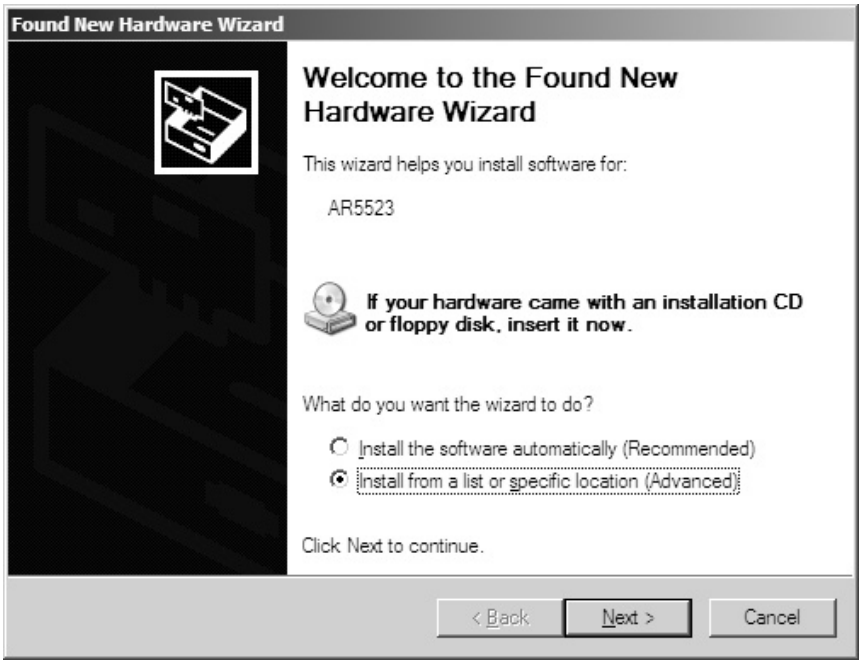
2. Choose Search for driver in these locations. The driver is located in the Ndis5x\2KXP directory. (For Windows 98SE/ME computers, the driver is located in the Ndis5x\98ME).


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
F:\ndis5x\2kxp
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

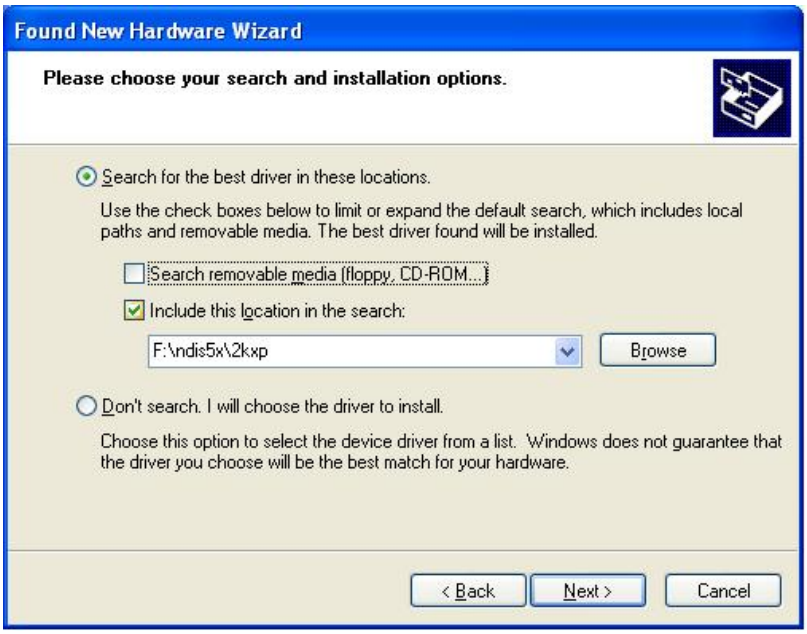
3. Windows may display a Windows Logo error for the bootloader. Click Continue Anyway. The installer will continue with the installation.


Hardware Installation
The software you are installing for this hardware:
Atheros USB 2.0 Wireless Adapter Bootloader Download
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

4. Click Finish to close the Found New Hardware Wizard and complete installation of the USB device bootloader.
5. The Found New Hardware Wizard opens to install software for the USB device. Click Next to continue.


Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
AR5523
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

6. Choose Search for driver in these locations. The driver is located in the Ndis5x\2KXP directory. (For Windows 98SE/ME computers, the driver is located in the Ndis5x\98ME).


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
F:\ndis5x\2kxp
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

7. Windows may display a Windows Logo error for the WLAN driver. Click Continue Anyway. The installer will continue the installation.

Hardware Installation
The software you are installing for this hardware:
Atheros USB 2.0 Wireless Network Adapter
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

8. Click Finish to close the Found New Hardware Wizard and complete installation of the Atheros USB Network Adapter.

Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
Atheros USB 2.0 Wireless Network Adapter
Click Finish to close the wizard.
< Back
Finish
Cancel

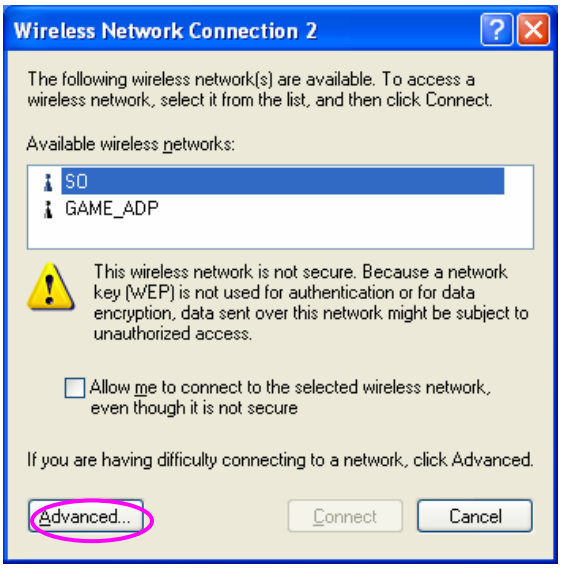
Use the ACU to configure the device driver. The ACU provides extensive online help to aid in configuring the device. Access the ACU by right-clicking the tray icon and choosing Atheros Client Utility.

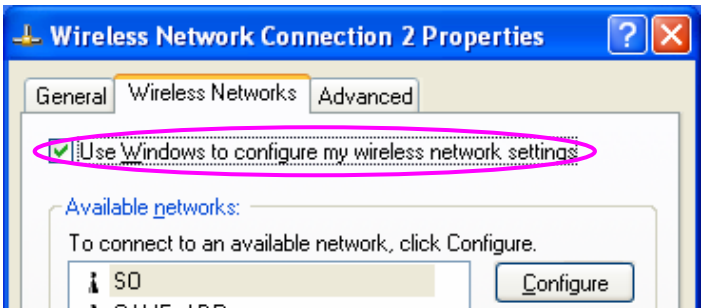
III. Using the Configuration Utility

To setup the USB adapter, double-click the icon in the system tray.

For Windows XP, there is a “Windows Zero Configuration Tool” by default for you to setup wireless clients. If you want to use the Utility of the USB adapter, please follow one of the ways as below.

A. Double-click the icon.
B. Click “Advance”.
C. Uncheck “Use Windows to configure my wireless network settings”.


Wireless Network Connection 2
The following wireless network(s) are available. To access a wireless network, select it from the list, and then click Connect.
Available wireless networks:
SO
GAME_ADP
This wireless network is not secure. Because a network key (WEP) is not used for authentication or for data encryption, data sent over this network might be subject to unauthorized access.
Allow me to connect to the selected wireless network, even though it is not secure
If you are having difficulty connecting to a network, click Advanced.
Advanced...
Connect
Cancel

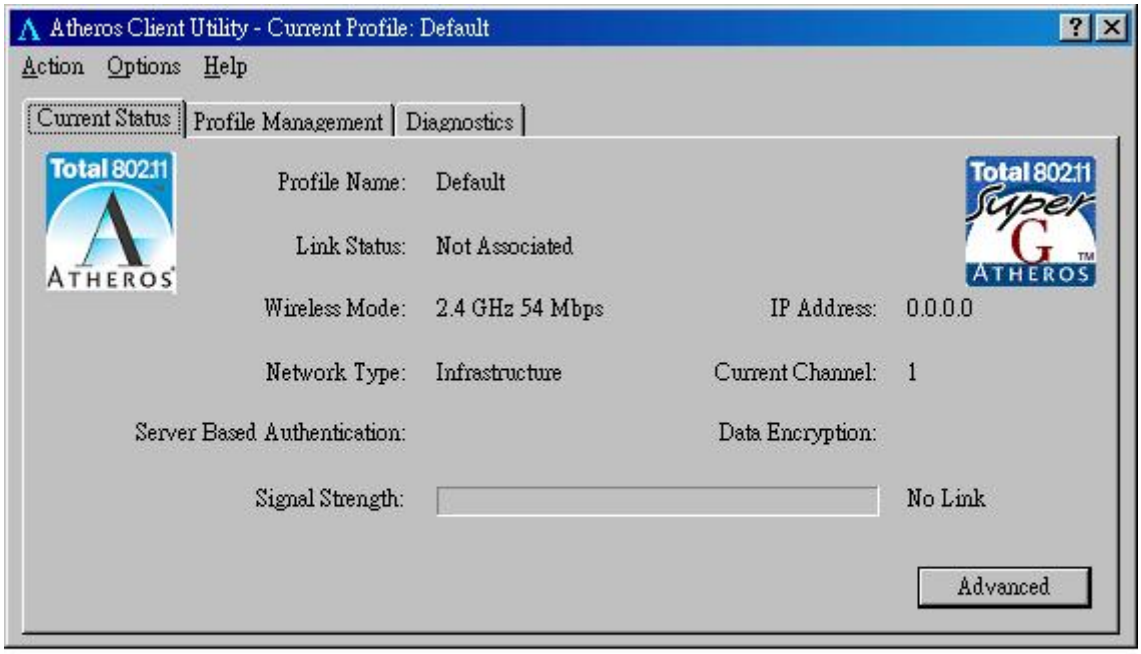


3 Configuration Utility

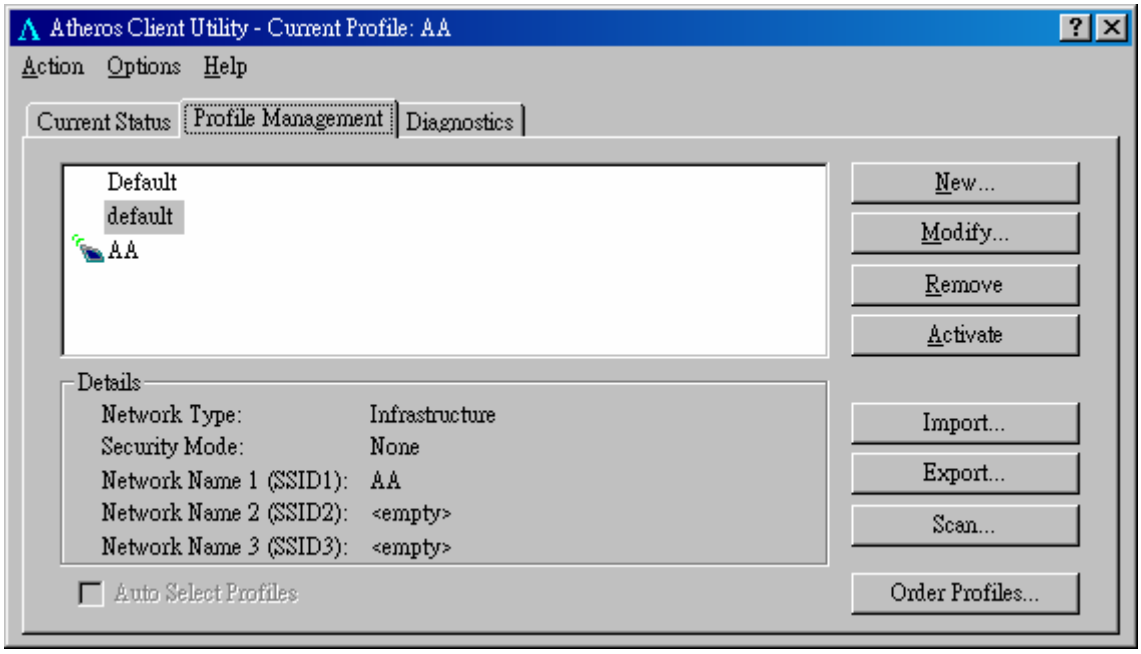
The Client Utility is a user-mode utility designed to edit and add profiles for, as well as display and diagnostics pertaining to a selected wireless USB adapter.

3.1 Wireless Connection Status

When you open the Configuration Utility, the system will scan all the channels to find all the access points/stations within the accessible range of your card and automatically connect to the wireless device with the highest signal strength. From the screen, you may know all the infomration about the wireless connection.



3.2 Profile Management



Parameter	Description
New	To add a new configuration profile, click New on the Profile Management tab. To modify a configuration profile, select the configuration from the Profile list and click the Modify button.
Modify	In the Atheros Client Utility, access the General tab by clicking New or Modify on the Profile Management tab. Edit the fields in the General tab to configure the configuration profile. Make sure to also edit the Security and Advanced tabs.
Remove	Select the profile to remove from the list of configuration profiles.
Import	1. From the Profile Management tab, click the Import button. The Import Profile window appears. 2. Browse to the directory where the profile is located. 3. Highlight the profile name. 4. Click Open. The imported profile appears in the profiles list.
Export	1. From the Profile Management tab, highlight the profile to export. 2. Click the Export button. The Export Profile window appears.

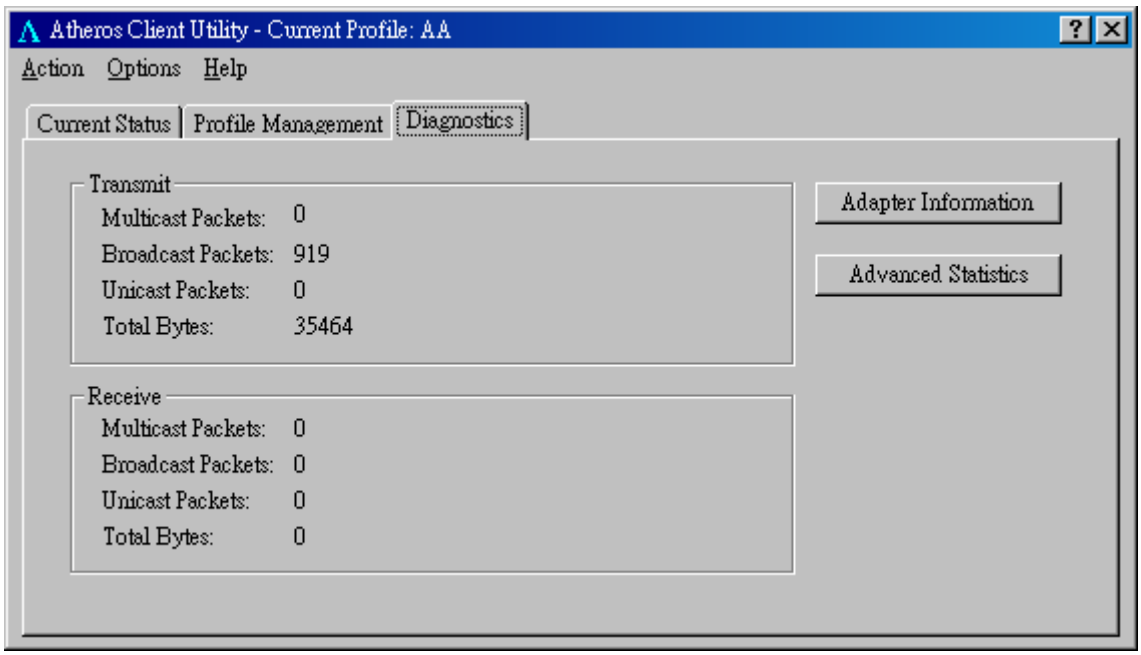
3. Browse to the directory to export the profile to.
4. Click Save. The profile is exported to the specified location.

Order Profiles

Including a profile in the auto selection feature allows the wireless adapter to automatically select that profile from the list of profiles and use it to connect to the network.

3.3 Diagnostics

The client utility includes a number of tools to display current diagnostics and status information.



Parameter	Description
Adapter Information	The Adapter Information button contains general information about the network interface card (the wireless network adapter) and the network driver interface specification (NDIS) driver.
Advanced Statistics	The Diagnostics tab of the Atheros Client Utility provides buttons used to retrieve receive and transmit statistics. The Diagnostics tab does not require any configuration

3.4 Security

This Chapter describes setting up security using the Atheros Client Utility(ACU).
While using the Atheros USB wireless network adapter, encryption data can protect its as it is transmitted through the wireless network.

While using the Atheros USB wireless network adapter, encrypting data can protect its privacy as it is transmitted through the wireless network.

The ACU allows connection profiles of:

- **No security** (not recommended)

  Link encryption/decryption is disabled, no keys are installed.

- **WPA security**

  Enables the use of Wi-Fi Protected Access (WPA). This option requires IT administration. This option includes the EAP (with dynamic WEP keys) security protocols: EAP, PEAP, and LEAP.

  WPA is a standard-based, interoperable security enhancement that provides data protection and access control for wireless LAN systems. It is derived from and is forward-compatible with the upcoming IEEE 802.11i standard. WPA leverages Temporal Key Integrity Protocol (TKIP) and Michael message integrity check (MIC) for data protection, and 802.1X for authenticated key management.

  WPA supports two mutually exclusive key management types: WPA and WPA passphrase (also known as WPA-Pre Shared Key (PSK)). Using WPA, clients and the authentication server authenticate to each other using an EAP authentication method, and the client and server generate a pairwise master key (PMK). The server generates the PMK dynamically and passes it to the access point.

- **WPA-PSK security**

  Enables WPA passphrase security (also known as WPA-Pre Shared Key (PSK)).

- **802.1x security**

  Enables 802.1x security. This option requires IT administration. This option includes the EAP (with dynamic WEP keys) security protocols: EAP, PEAP, and LEAP.

  802.1x is the standard for wireless LAN security defined by IEEE as 802.1x for 802.11, or simply 802.1x. An access point that supports 802.1x and its protocol, Extensible Authentication Protocol (EAP), acts as the interface between a wireless client and an authentication server such as a RADIUS server, to which the access point communicates over the wired network.

- **Pre-Shared Key security (Static WEP)**

  Static WEP enables the use of up to four pre-shared (static wired equivalent privacy (WEP)) keys that are defined on both the access point and the client station. These keys are stored in an encrypted format in the registry of the Windows device. When the driver loads and reads the USB device's registry parameters, it also finds the static WEP keys, decrypts them, and stores them in volatile memory on the USB device.

  If a device receives a packet that is not encrypted with the appropriate key, the device discards the packet and never delivers it to the intended recipient.

This is because the WEP keys of all devices that are to communicate with each other must match.

Authentication Process
Enabling EAP on the access point and configuring the USB device to LEAP, EAP-TLS, PEAP (EAP-GTC), or PEAP (EAP-MSCHAP V2) authentication to the network occurs in the following sequence:

1. The client associates to an access point and begins authentication.

2. Communicating through the access point, the client and RADIUS server complete authentication with the password (LEAP and PEAP) or certificate (EAP-TLS). The password is never transmitted during the process.

3. After successful authentication, the client and RADIUS server derive a dynamic WEP key unique to the client.

4. The RADIUS server transmits the key to the access point using a secure channel on the wired LAN.

5. For the length of a session the access point and the client use this key to encrypt or decrypt all unicast packets (and broadcast packets).

Overview Of the Security Configuration Options In ACU

Radio Button	Description
WPA	Enables the use of Wi-Fi Protected Access (WPA). Choosing WPA opens the WPA EAP drop-down menu. The options include: ■ EAP-TLS ■ EAP-TTLS ■ PEAP (EAP-GTC) ■ PEAP (EAP-MSCHAP V2) ■ LEAP
WPA Passphrase	Enables WPA Passphrase security. Click on the Configure button and fill in the WPA Passphrase.
802.1x	Enables 802.1x security. This option requires IT administration. Choosing 802.1x opens the 802.1x EAP type drop-down menu. The options include: ■ EAP-TLS ■ EAP-TTLS ■ PEAP (EAP-GTC) ■ PEAP (EAP-MSCHAP V2) ■ LEAP If the access point that the wireless adapter is associating to has WEP set to Optional and the client has WEP enabled, make sure

	that Allow Association to Mixed Cells is checked on the Security Tab to allow association.
Pre-Shared Key(Static WEP)	Enables the use of pre-shared keys that are defined on both the access point and the station. To define pre-shared encryption keys, choose the Pre-Shared Key radio button and click the Configure button to fill in the Define Pre-Shared Keys window. If the access point that the wireless adapter is associating to has WEP set to Optional and the client has WEP enabled, make sure that Allow Association to Mixed Cells is checked on the Security Tab to allow association.
None	No security (not recommended).

3.4.1 WPA Security Settings

EAP Security

To use EAP security, access the Security tab in Profile Management.

1. In the ACU, edit the security settings by clicking New or Modify on the Profile Management tab.

2. Choose a profile to edit, or name the new profile in the Profile Management window. Enter the SSID of the access point the station connects to.

3. On the Security tab, choose the WPA radio button.

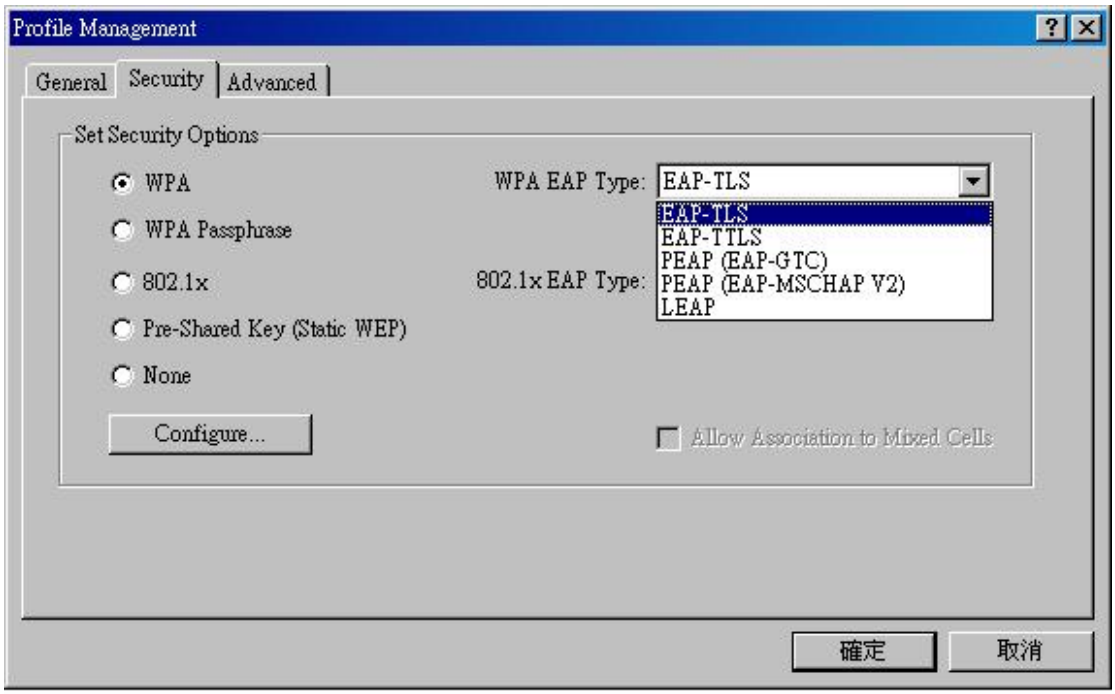
OR: On the Security tab, choose the 802.1x radio button.

4. Choose EAP-TLS or EAP-TTLS from the drop-down menu

Using EAP-TLS Security

Important Note: To use EAP-TTLS security, the machine must already have the EAP-TTLS certificates downloaded onto it from a Certificate Authority (CA). Please check with your IT administrator.

To use EAP-TLS security In the Atheros Client Utility, access the Security tab in the Profile Management window.



1. On the Security tab, choose the WPA radio button.
   OR: On the Security tab, choose the 802.1x radio button.
2. Choose EAP-TLS from the drop-down menu.

Enabling EAP-TLS security:

Important Note: To use EAP-TTLS security, the machine must already have the EAP-TTLS certificates downloaded onto it from a Certificate Authority (CA). Please check with your IT administrator.

1. If EAP-TLS is supported, choose EAP-TLS from the drop-down menu on the right, then click the Configure button.
2. Select the appropriate certificate authority from the list. The server/domain name and the login name are filled in automatically from the certificate information. Click OK.
3. Click OK.
4. Activate the profile.

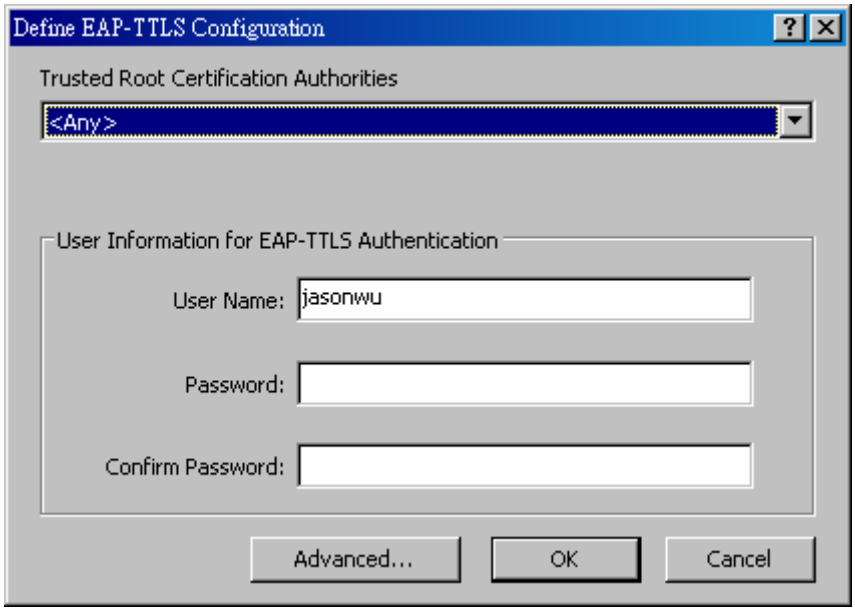
Using EAP-TTLS Security

Important Note: To use EAP-TTLS security, the machine must already have the EAP-TTLS certificates downloaded onto it from a Certificate Authority (CA). Please check with your IT administrator.

To use EAP security In the Atheros Client Utility, access the Security tab in the Profile Management window.

1. On the Security tab, choose the WPA radio button.
   OR: On the Security tab, choose the 802.1x radio button.
2. Choose EAP-TTLS from the drop-down menu.

Enabling EAP-TTLS security:



1. If EAP-TTLS is supported, choose EAP-TTLS from the drop-down menu on the right, then click the Configure button.
2. Select the appropriate certificate from the drop-down list and click OK.
3. Specify a user name for EAP authentication:
   - Check Use Windows User Name to use the Windows user name as the EAP user name.
   - OR: Enter a EAP user name in the User Name field to use a separate user name and password and start the EAP authentication process.
4. Click Advanced and:
   - Leave the server name field blank for the client to accept a certificate from any server with a certificate signed by the authority listed in the Network Certificate Authority drop-down list. **(recommended)**
   - Enter the domain name of the server from which the client will accept a certificate.
   - Change the login name if needed.
5. Click OK.
6. Enable the profile.

Using PEAP-GTC Security

Important Note! To use PEAP (EAP-GTC) security, the server must have WPA-PEAP certificates, and the Certificate Authority (CA) server properties must already be set up. Please check with your IT administrator.

To use PEAP security, access the Security tab in the Profile Management window.

1. In the ACU, edit the security settings by clicking New or Modify on the Profile Management tab.

2. Choose a profile to edit, or name the new profile in the Profile Management window. Enter the SSID of the access point the client computer connects to.

3. On the Security tab, choose the WPA radio button.

OR: On the Security tab, choose the 802.1x radio button.

4. Choose PEAP (EAP-GTC) or PEAP (EAP-MSCHAP V2) from the drop-down menu.

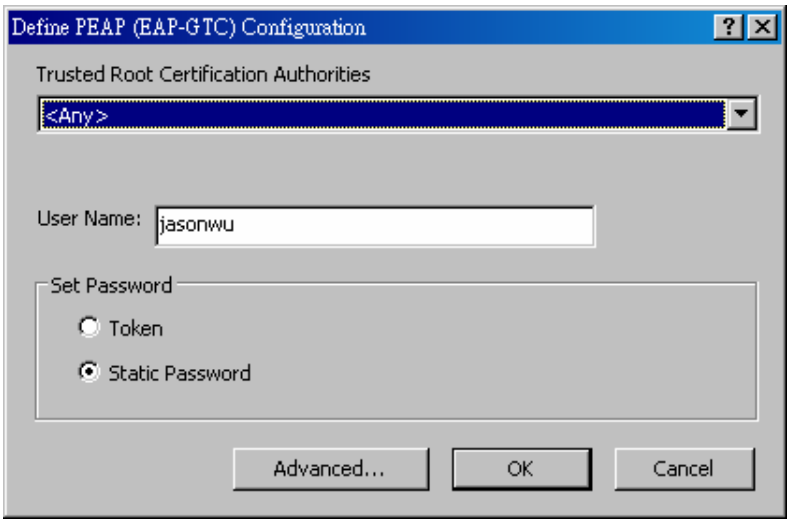
- PEAP (EAP-GTC) authentication is designed to support one-time Password (OTP), Windows 2000 domain, and L DAP user databases over a wireless LAN. It is based on EAP-TLS authentication but uses a password instead of a client certificate for authentication. PEAP (EAPGTC) uses a dynamic session-based WEP key derived from the USB device and RADIUS server to encrypt data.

  Networks that use an OTP user database require entering a hardware or software token password to start the PEAP (EAP-GTC) authentication process and to gain access to the network. Networks that use a Windows 2000 domain user database or an L DAP user database (such as NDS) require entering a username, password, and domain name in order to start the PEAP (EAP-GTC) authentication process.

- The PEAP (EAP-MSCHAP V2) authentication type is based on EAPTLS authentication, but uses password instead of a client certificate for authentication. PEAP (EAP-MSCHAP V2) uses a dynamic session-based WEP key, which is derived from the USB device and RADIUS server, to encrypt data.

To use PEAP-GTC security In the Atheros Client Utility, access the Security tab in the Profile Management window.

1. On the Security tab, choose the WPA radio button.
2. OR: On the Security tab, choose the 802.1x radio button.
3. Choose PEAP (EAP-GTC) from the drop-down menu.
4. Click the Configure button.
5. Select the appropriate network certificate authority from the drop-down list.
6. Specify a user name for inner PEAP tunnel authentication:
   - Check Use Windows User Name to use the Windows user name as the PEAP user name.
   - OR: Enter a PEAP user name in the User Name field to use a separate user name and start the PEAP authentication process.



7. Choose Token or Static Password, depending on the user database.

   Note that Token uses a hardware token device or the Secure Computing SofToken program (version 1.3 or later) to obtain and enter a one-time password during authentication.

8. Click Advanced and:

   - Leave the server name field blank for the client to accept a certificate from any server with a certificate signed by the authority listed in the Network Certificate Authority drop-down list. **(recommended)**
   - Enter the domain name of the server from which the client will accept a certificate.

9. The login name used for PEAP tunnel authentication, fills in automatically as PEAP-*xxxxxxxxxxxx*, where *xxxxxxxxxxxx* is the computer's MAC address. Change the login name if needed.

10. Click OK.

11. Enable the profile.

Using PEAP-MSCHAP V2 Security

Important Note! To use PEAP (EAP-MSCHAP V2) security, the server must have WPA-PEAP certificates, and the server properties must already be set. Check with the IT manager.

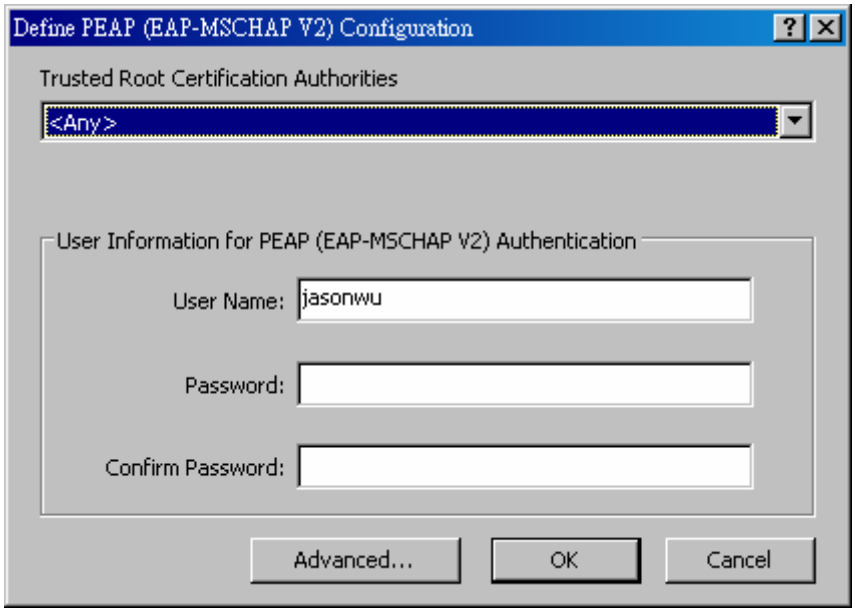
To use PEAP-MSCHAP V2 security In the Atheros Client Utility, access the Security tab in the Profile Management window.

1. On the Security tab, choose the WPA radio button.
   OR: On the Security tab, choose the 802.1x radio button.

2. Choose PEAP (EAP-MSCHAP V2) from the drop-down menu.

3. Click the Configure button.

4. Select the appropriate certificate from the drop-down list.



5. Specify a user name for inner PEAP tunnel authentication:
   - Check Use Windows User Name to use the Windows user name as the PEAP user name.
   - OR: Enter a PEAP user name in the User Name field to use a separate user name and start the PEAP authentication process.
6. Click Advanced and:
   - Leave the server name field blank for the client to accept a certificate from any server with a certificate signed by the authority listed in the Network Certificate Authority drop-down list. **(recommended)**
   - Enter the domain name of the server from which the client will accept a certificate.
   - The login name used for PEAP tunnel authentication, fills in automatically as PEAP-*xxxxxxxxxxxx*, where *xxxxxxxxxxxx* is the computer's MAC address. Change the login name if needed.
7. Click OK.
8. Enable the profile.

Using LEAP Security

Important Note! LEAP security requires that all infrastructure devices (e.g. access points and servers) are configured for LEAP authentication. Check with the IT manager.

To use security In the Atheros Client Utility, access the Security tab in the Profile Management window.

Configuring LEAP:

The LEAP authentication type uses Cisco Key Integrity Protocol (CKIP) and MMH message integrity check (MIC) for data protection. The USB device uses the username and password to perform mutual authentication with the RADIUS server through the access point. To use LEAP security, access the Security tab in Profile Management.

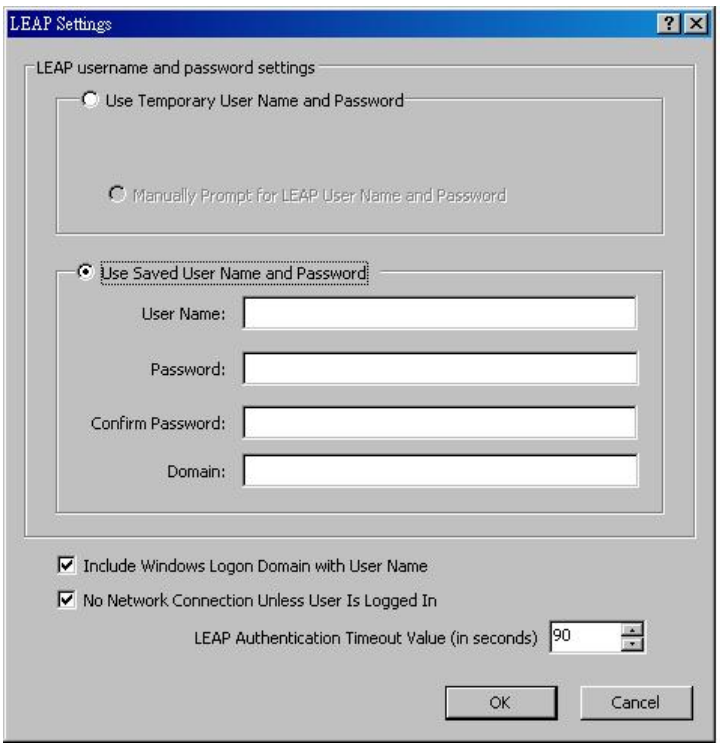
1. In the ACU, edit the security settings by clicking New or Modify on the Profile Management tab.

2. Choose a profile to edit, or name the new profile in the Profile Management window. Enter the SSID of the access point the station connects to.

3. On the Security tab, choose the WPA radio button.

OR: On the Security tab, choose the 802.1x radio button.

4. Choose LEAP from the drop-down menu.



1. Click the Configure button.
2. Specify a user name and password:

   Select to Use Temporary User Name and Password by choosing the radio button:

- Check Use Windows User Name to use the Windows user name as the LEAP user name.
- OR: Check Manually Prompt for LEAP User Name and Password to manually login and start the LEAP authentication process.

Select to Use Saved User Name and Password by choosing the radio button:

- Specify the LEAP user name, password, and domain to save and use.

3. Enter the user name and password.
4. Confirm the password.
5. Specify a domain name:
   - Check the Include Windows Logon Domain with User Name setting to pass the Windows login domain and user name to the RADIUS server. **(default)**
   - OR: Enter a specific domain name.
6. If desired, check No Network Connection Unless User Is Logged In to force the wireless adapter to disassociate after logging off.
7. Enter the LEAP authentication timeout time (between 30 and 500 seconds) to specify how long LEAP should wait before declaring authentication failed, and sending an error message. The default is 90 seconds.
8. Click OK.
9. Enable the profile.

3.4.2 Using WPA Passphrase Security

To use WPA Passphrase security In the Atheros Client Utility, access the Security tab in the Profile Management window.

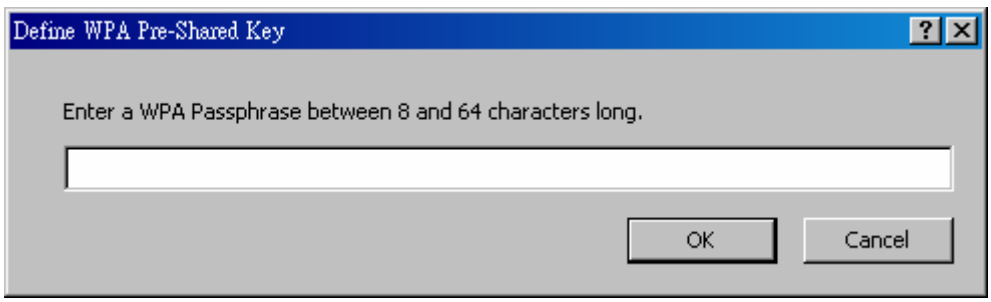
1. In the ACU, edit the security settings by clicking New or Modify on the Profile Management tab.

2. Choose a profile to edit, or name the new profile in the Profile Management window. Enter the SSID of the access point the client computer connects to.

3. On the Security tab, choose WPA Passphrase.

4. Click on the Security tab, and choose the WPA-PSK radio button. Click the Configure button.

.



5. Enter the WPA passphrase (for ASCII text, enter 8-63 characters, for hexadecimal, enter 64 characters). Click OK.

6. Click OK and enable the profile.

3.4.3 Pre-Shared Encryption Keys

To use Pre-Shared Key (static WEP) security In the Atheros Client Utility, access the Security tab in the Profile Management window.

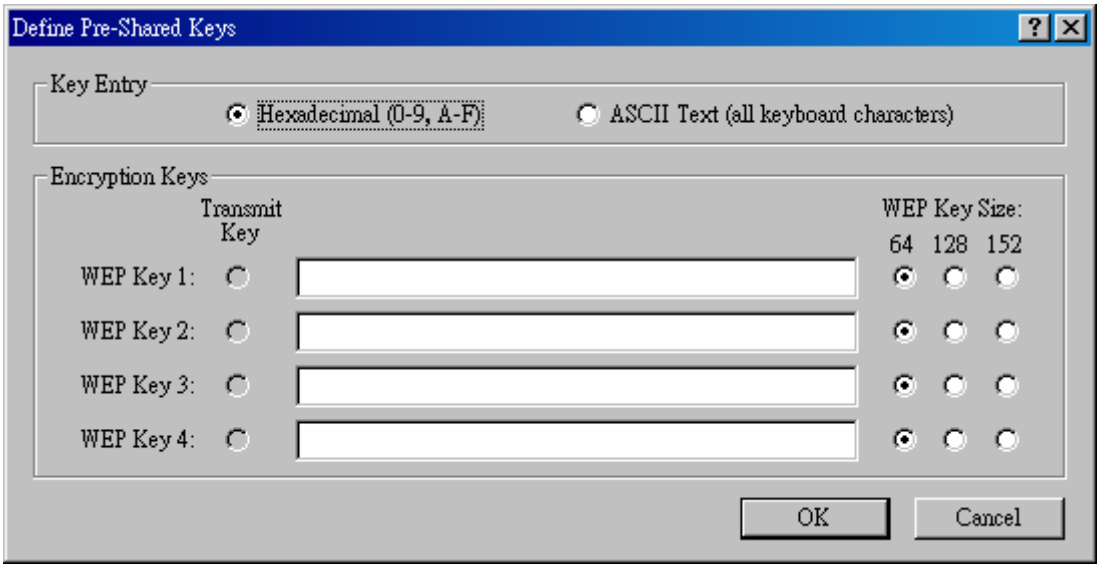
1. In the ACU, edit the security settings by clicking New or Modify on the Profile Management tab.

2. Choose a profile to edit, or name the new profile in the Profile Management window. Enter the SSID of the access point the client computer connects to.

3. On the Security tab, choose Pre-Shared Key (Static WEP).

Defining pre-shared encryption keys:

1. Click the Define Pre-Shared Keys radio button on the Security tab.
2. Click on Configure.
3. Fill in the fields in the WEP Encryption keys dialog box:



Key Button	Description
Key Entry	Determines the entry method for an encryption key: hexadecimal (0-9, A-F), or ASCII text (all keyboard characters except spaces).
Encryption Keys	Selects the default encryption keys used. Only allows the selection for a shared First, Second, Third, or Fourth key whose corresponding field has been completed.
WEP Keys (1-4)	Defines a set of shared encryption keys for network

configuration security. At least one Shared Key field must be populated to enable security using a shared key.
Click on the radio button to set the key as the default encryption key.

WEP Key Size — Defines the size for each encryption key. The options include:

- 64- bit (enter 10 digits for hexadecimal, 5 ASCII characters)
- 128- bit (enter 26 digits for hexadecimal, 13 digits for ASCII)
- 152-bit (enter 32 digits hexadecimal, 16 digits for ASCII)

4. Click OK for the changes to take effect.

Overwriting an Existing Static WEP Key

1. Click the Define Pre-Shared Keys radio button on the Security tab.
2. Click on Configure.
3. In the window, all existing static WEP keys are displayed as asterisks for security reasons. Click in the field of the existing static WEP key to overwrite.
4. Delete the asterisks in that field.
5. Enter a new key.
6. Make sure to select the Transmit Key button to the left of this key is selected for the key to transmit packets.
7. Click OK.

Disabling Static WEP

- To disable static WEP for a particular profile, choose None on the Profile Management tab and click OK.
- OR: Select any other security option on the Profile Management tab to automatically disable static WEP.

4 Troubleshooting

This chapter provides solutions to problems usually encountered during the installation and operation of the adapter.

1. **For Windows 98SE computers, if the Atheros Client Utility fails to load after properly installation, click on the windows "Start" button on your toolbar, select the "run" button, and enter "C:\Windows\system\aegis2.exe" into the dialog box, then press enter, a dialog box will pop up, please select "install" then press "enter".**

2. **For Windows XP or Windows XP SP1, please update your windows with the following hotfix *http://support.microsoft.com/?scid=kb%3Ben-us%3B822603&x=10&y=13* if your copy of Windows XP has been updated with Service Pack 2 (SP2), you do not need to apply this hotfix.**

3. **To Uninstall the Atheros Client Utility, please double click on "setup" on your driver installation CD, then select the uninstall option, then press enter.**

4. **In Windows ME, if you receive an error about IPHLPAPI.DLL, please logoff your account, and re-login your account.**

5. **In Windows 98SE/ME, Errors may be encountered when the drivers are installed through the "Found New Hardware Wizard" by choosing "Don't search. I will choose the driver to install". To prevent this error, please follow page 7 of this user's manual.**

Frequently Asked Questions (FAQ)

1. What is the IEEE 802.11g standard?

802.11g is the new IEEE standard for high-speed wireless LAN communications that provides for up to 54 Mbps data rate in the 2.4 GHz band. 802.11g is quickly becoming the next mainstream wireless LAN technology for the home, office and public networks. 802.11g defines the use of the same OFDM modulation technique specified in IEEE 802.11a for the 5 GHz frequency band and applies it in the same 2.4 GHz frequency band as IEEE 802.11b. The 802.11g standard requires backward compatibility with 802.11b.

The standard specifically calls for:

A. A new physical layer for the 802.11 Medium Access Control (MAC) in the 2.4 GHz frequency band, known as the extended rate PHY (ERP). The ERP adds OFDM as a mandatory new coding scheme for 6, 12 and 24 Mbps (mandatory speeds), and 18, 36, 48 and 54 Mbps (optional speeds). The ERP includes the modulation

schemes found in 802.11b including CCK for 11 and 5.5 Mbps and Barker code modulation for 2 and 1 Mbps.

B. A protection mechanism called RTS/CTS that governs how 802.11g devices and 802.11b devices interoperate.

2. What is the IEEE 802.11b standard？

The IEEE 802.11b Wireless LAN standard subcommittee, which formulates the standard for the industry. The objective is to enable wireless LAN hardware from different manufactures to communicate.

3. What does IEEE 802.11 feature support？

The product supports the following IEEE 802.11 functions:

- CSMA/CA plus Acknowledge Protocol
- Multi-Channel Roaming
- Automatic Rate Selection
- RTS/CTS Feature
- Fragmentation
- Power Management

4. What is Ad-hoc？

An Ad-hoc integrated wireless LAN is a group of computers, each has a Wireless LAN adapter, Connected as an independent wireless LAN. Ad hoc wireless LAN is applicable at a departmental scale for a branch or SOHO operation.

5. What is Infrastructure？

An integrated wireless and wireless and wired LAN is called an Infrastructure configuration. Infrastructure is applicable to enterprise scale for wireless access to central database, or wireless application for mobile workers.

6. What is BSS ID？

A specific Ad hoc LAN is called a Basic Service Set (BSS). Computers in a BSS must be configured with the same BSS ID.

7. What is WEP？

WEP is Wired Equivalent Privacy, a data privacy mechanism based on a 40 bit shared key algorithm, as described in the IEEE 802 .11 standard.

8. What is TKIP?

TKIP is a quick-fix method to quickly overcome the inherent weaknesses in WEP security, especially the reuse of encryption keys. TKIP is involved in the IEEE 802.11i WLAN security standard, and the specification might be officially released by early 2003.

9. What is AES?

AES (Advanced Encryption Standard), a chip-based security, has been developed to ensure the highest degree of security and authenticity for digital information, wherever

and however communicated or stored, while making more efficient use of hardware and/or software than previous encryption standards. It is also included in IEEE 802.11i standard. Compare with AES, TKIP is a temporary protocol for replacing WEP security until manufacturers implement AES at the hardware level.

10. Can Wireless products support printer sharing ?

Wireless products perform the same function as LAN products. Therefore, Wireless products can work with Netware, Windows 2000, or other LAN operating systems to support printer or file sharing.

11. Would the information be intercepted while transmitting on air ?

WLAN features two-fold protection in security. On the hardware side, as with Direct Sequence Spread Spectrum technology, it has the inherent security feature of scrambling. On the software side, WLAN series offer the encryption function (WEP) to enhance security and Access Control. Users can set it up depending upon their needs.

12. What is DSSS ? What is FHSS ? And what are their differences ?

Frequency-hopping spread-spectrum (FHSS) uses a narrowband carrier that changes frequency in a pattern that is known to both transmitter and receiver. Properly synchronized, the net effect is to maintain a single logical channel. To an unintended receiver, FHSS appears to be short-duration impulse noise. Direct-sequence spread-spectrum (DSSS) generates a redundant bit pattern for each bit to be transmitted. This bit pattern is called a chip (or chipping code). The longer the chip is, the greater the probability that the original data can be recovered. Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the radio can recover the original data without-the need for retransmission. To an unintended receiver, DSSS appears as low power wideband noise and is rejected (ignored) by most narrowband receivers.

13. What is Spread Spectrum ?

Spread Spectrum technology is a wideband radio frequency technique developed by the military for use in reliable, secure, mission-critical communication systems. It is designed to trade off bandwidth efficiency for reliability, integrity, and security. In other words, more bandwidth is consumed than in the case of narrowband transmission, but the trade off produces a signal that is, in effect, louder and thus easier to detect, provided that the receiver knows the parameters of the spread-spectrum signal being broadcast. If a receiver is not tuned to the right frequency, a spread –spectrum signal looks like background noise. There are two main alternatives, Direct Sequence Spread Spectrum (DSSS) and Frequency Hopping Spread Spectrum (FHSS).